| | Application No. | Applicant(s) |
|---|---|---|
| **Notice of Allowability** | 10/611,772 | HENNESSEY ET AL. |
| | Examiner | Art Unit | |
| | Dmitry Levitan | 2616 | . |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--*

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *6/30/03*.

2. ☒ The allowed claim(s) is/are *1-21*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All    b) ☐ Some*    c) ☐ None  of the:

        1. ☐ Certified copies of the priority documents have been received.

        2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

        3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

    * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.

    (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached

        1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____ .

    (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of
        Paper No./Mail Date _____ .

    **Identifying indicia** such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)

2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)

3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____

4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application

6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .

7. ☒ Examiner's Amendment/Comment

8. ☒ Examiner's Statement of Reasons for Allowance

9. ☒ Other *Attachment A, Attachment B.*

## EXAMINER'S AMENDMENT

1.      An examiner's amendment to the record appears below. Should the changes and/or

additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR

1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the

payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with

Judith A. Szepesi on 3/23/07.

The application has been amended as follows:

2.      Specification has been amended per Attachment A.

Note. Specification has been amended to insert the application serial number and to clarify the

abbreviations in the specification.

3.      Claims have been amended per Attachment B.

Note. Claim 8 has been amended to avoid statutory problems with the claim, and the rest of the

amended claimed were amended for clarity.


### *Allowable Subject Matter*

4.      Claims 1-21 are allowed.

5.      The following is an examiner's statement of reasons for allowance:

The present invention is directed to a topology discovery of client nodes in the peer-to-peer

systems. The prior art of record does not teach or fairly suggest at least the following:

performing traceroute operation to obtain a client discovery to a directory server, sending the

traceroute map to the directory server and building a router graph representing the topology of

the peer-to-peer network based on the traceroute information, as specified in independent claims

1, 8 and 15.

The closest prior art, Farber, US 6,185,598, fails to anticipate or render the above limitations

obvious.

Any comments considered necessary by applicant must be submitted no later than the payment

of the issue fee and, to avoid processing delays, should be preferably accompany the issue fee.

Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance"


## *Conclusion*

The claims being allowed, **Prosecution On The Merits Is Closed** in this application.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Dmitry Levitan whose telephone number is 571-272-3093. The

examiner can normally be reached on 8:30 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Chi Pham can be reached on 571-272-33179. The fax phone number for the

organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the receptionist whose telephone number is 703-305-4750.


Dmitry Levitan
Patent Examiner.

# Attachment A.

Please replace the following paragraphs with the amended paragraphs below:

[0001] The subject matter of this application is related to the subject matter in a co-pending non-provisional application by the same inventors as the instant application and filed on the same day as the instant application entitled, "Method and Apparatus for Establishing Peering Rules for Distributed Content Delivery," having serial number ~~TO BE ASSIGNED~~ 10/611,783, and filing date ~~TO BE ASSIGNED~~ June 30, 2003 ~~(Attorney Docket No. KON03-0003)~~.

[0043] FIG. 5 illustrates the directory server inventory 212 from FIG. 2 in accordance with an embodiment of the present invention. Inventory 212 includes a list of all of the content and possible candidate servers of the content that are known by directory server 104. Inventory 212 also contains media object identifier (MOID) 408 which identifies the content, node 502 which identifies a candidate server for the content, and range set 504 which identifies the pieces of the content that the candidate server has been reported as having in the past. Inventory 212 can be a subset of the entire universe of available content. Note that this facilitates scalability as different subsets of the entire universe of available content can reside on multiple directory servers. In another embodiment, range set 504 may not be included in inventory 212.

[0044] In one embodiment of the present invention, node 502 is identified using standard Public Key infrastructure (PKI) techniques.

[0062] A target that does not support range requests is effectively asked for the first needed range. Any other target is asked for a range starting at a preferred offset, and stopping at the size cap, the end of file (EOF), or the next range already loaded or allocated to a loader. If a loader reaches a range allocated to another loader, it is preempted (the loader gives up the target, which is made available for other loaders). When there is little left to download, loaders may all load the same range (racing to finish the download).

[0074]  FIG. 10 presents a flowchart illustrating the process of utilizing network arena 204 in accordance with an embodiment of the present invention.  In the present invention, an arena, such as arena 204, is an administrative unit that contains a group of nodes.  Arena 204 could be as small as a router group or a local network, or arena 204 could be as large as an entire AS, or possibly even larger.  Definitions can include subnets, IP/X network ranges (IP/X network is a collection of nodes that share a common IP address prefix consisting of X bytes), and nodes behind specific routers.  The system starts be receiving a definition for arena 204 from a system administrator (step 1002).  The system can also receive corresponding routing rules from the system administrator (step 1004).  These routing rules can define the order of precedence for fallback within each match set within match sets 200.  Additionally, these rules define the order of precedence for fallback between match sets, as well as which sets to avoid, and when to return to origin server 112.

# Attachment B.

**Listing of Claims:**

1.      (Currently Amended) A method for determining a network topology in a peer-to-peer network, comprising:

performing a tracerouting operation to obtain a traceroute from a first client to a directory server, wherein a traceroute is a map of ~~the~~ a path through which a packet travels between the first client and the directory server, including addresses of ~~the~~ routers through which the packet travels;

sending the traceroute to the directory server from the first client; and

using the traceroute at the directory server to build a router graph, wherein the router graph represents the topology of the peer-to-peer network.

2.      (Original) The method of claim 1, further comprising:

performing a tracerouting operation between the first client and a second client; and

sending the traceroute to the directory server.

3.      (Currently Amended) The method of claim 1, further comprising:

determining a ~~the~~ MAC address of the first client's gateway; and

sending the MAC address to the directory server, wherein the directory server can use ~~the~~ MAC address to determine if any other clients are on the same subnet as the first client.

4.      (Original) The method of claim 1, further comprising:

sorting a list of addresses for routers received at the directory server from the traceroutes; and

using the sorted list to determine which addresses are assigned to which routers, wherein each router has two or more network interfaces and each interface has an address.

5.      (Original) The method of claim 1, further comprising using the router graph to optimize data transfer within the peer-to-peer network.

6. (Currently Amended) The method of claim 1, further comprising classifying the first client as a member of a router group based on a ~~the~~ first public address found in the traceroute, wherein the router group is a collection of clients that communicate through a common router.

7. (Original) The method of claim 1, further comprising removing information from the router graph if the information has not been validated for a specified period of time.

8. (Currently Amended) A computer-readable storage medium, which includes magnetic and optical storage devices such as disk drives, magnetic tape, CDs (compact discs) and DVDs (digital versatile discs or digital video discs), storing instructions that when executed by a computer cause the computer to perform a method for determining a network topology in a peer-to-peer network, the method comprising:

performing a tracerouting operation to obtain a traceroute from a first client to a directory server, wherein a traceroute is a map of a ~~the~~ path through which a packet travels between the first client and the directory server, including addresses of ~~the~~ routers through which the packet travels;

sending the traceroute to the directory server from the first client; and

using the traceroute at the directory server to build a router graph, wherein the router graph represents the topology of the peer-to-peer network.

9. (Original) The computer-readable storage medium of claim 8, wherein the method further comprises:

performing a tracerouting operation between the first client and a second client; and

sending the traceroute to the directory server.

10. (Currently Amended) The computer-readable storage medium of claim 8, wherein the method further comprises:

determining a the MAC address of the first client's gateway; and

sending the MAC address to the directory server, wherein the directory server can use the MAC address to determine if any other clients are on the same subnet as the first client.

11.    (Original) The computer-readable storage medium of claim 8, wherein the method further comprises:

sorting a list of addresses for routers received at the directory server from the traceroutes; and

using the sorted list to determine which addresses are assigned to which routers, wherein each router has two or more network interfaces and each interface has an address.

12.    (Original) The computer-readable storage medium of claim 8, wherein the method further comprises using the router graph to optimize data transfer within the peer-to-peer network.

13.    (Currently Amended) The computer-readable storage medium of claim 8, wherein the method further comprises classifying the first client as a member of a router group based on a the first public address found in the traceroute, wherein the router group is a collection of clients that communicate through a common router.

14.    (Original) The computer-readable storage medium of claim 8, wherein the method further comprises removing information from the router graph if the information has not been validated for a specified period of time.

15.    (Currently Amended) An apparatus for determining a network topology in a peer-to-peer network, comprising:

a tracerouting mechanism configured to perform a tracerouting operation to obtain a traceroute from a first client to a directory server, wherein a traceroute is a map of a the path through which a packet travels between the first client and the directory server, including addresses of the routers through which the packet travels;

an upload mechanism configured to send the traceroute to the directory server from the first client; and

a graph building mechanism configured to use the traceroute at the directory server to build a router graph, wherein the router graph represents the topology of the peer-to-peer network.

16.    (Original) The apparatus of claim 15, wherein the tracerouting mechanism is further configured to perform a tracerouting operation between the first client and a second client.

17.    (Currently Amended) The apparatus of claim 15, further comprising:

a determination mechanism configured to determine a the MAC address of the first client's gateway;

wherein the upload mechanism is further configured to send the MAC address to the directory server, wherein the directory server can use the MAC address to determine if any other clients are on the same subnet as the first client.

18.    (Original) The apparatus of claim 15, further comprising:

a sorting mechanism configured to sort a list of addresses for routers received at the directory server from the traceroutes; and

a determination mechanism configured to use the sorted list to determine which addresses are assigned to which routers, wherein each router has two or more network interfaces and each interface has an address.

19.    (Original) The apparatus of claim 15, further comprising an optimization mechanism configured to use the router graph to optimize data transfer within the peer-to-peer network.

20.    (Currently Amended) The apparatus of claim 15, further comprising a classification mechanism configured to classify the first client as a member of a router group based on a the first public address found in the traceroute, wherein the router group is a collection of clients that communicate through a common router.

21.    (Original) The apparatus of claim 15, further comprising a removal mechanism configured to remove information from the router graph if the information has not been validated for a specified period of time.